

ANNEXURE B

Villiers Waste Water Works: MCC DATA

Description	Drawing Code	Kw	Voltage	Qty	unit	Starting method	Duty	Stdby	Control		Flow Measurement
MCC1 - INLETWORKS EQUIPMENT											
Channel Grinder & Auger	AM1a	0,75	380	1	ea	DOL	1	0	On/off		Ultrasonic sensor located at the venturi of the inletworks
Degritter	DG1a	0,55	265/460	1	ea	DOL	1	0	On/off		
Grinder for Mechancial Screen	GM1a	2,2	230-400	1	ea	DOL	1	0	On/off		
Mechanical Screen	MS1a	0,75	380	1	ea	DOL	1	0	On/off		
Gritter Classifier	GC1a	1,5	230/400	1	ea	DOL	1	0	On/off		
MCC2 - BALANCING PUMP STATION FEEDING BNR REACTOR EQUIPMENT											
Reactor Feed pumps	P1a,b	11	380	3	ea	VSD	2	1	On/off/Test. On = stop low level, start HL. Immersible pressure switch	Local isolator	ELECTRO MAG FLOW METER
MCC3 - REACTOR, CLARIFIER AND RECIRCULATION PUMP STATION EQUIPMENT											
REACTOR EQUIPMENT											
Pre-anaerobic mixers	M1a	2,2	380	1	ea	DOL	1		On/off	Local isolator	N/A
Anaerobic mixers	M1b,c	4	380	2	ea	DOL	2		On/off	Local isolator	N/A
Anoxic mixers	M2a,b,c,d	5,5	380	4	ea	DOL	4		On/off	Local isolator	N/A
Aerators stage 1 (Motors MUST be Suitable for VSD)	A1a,b	30	380	2	ea	VSD	2		On/off. On on, speed control by oxygen concentration input, 4-20mA. 4A = 40% speed. 20mA = max speed	Local isolator	N/A
Aerators stage 2 (Motors MUST be Suitable for VSD)	A2a,b	22	380	2	ea	VSD	2		On/off. On on, speed control by oxygen concentration input, 4-20mA. 4A = 40% speed. 20mA = max speed	Local isolator	N/A
Stable 220V supply for DO meter and controller: Note that this 4-20mA feed must go through a splitter to control all 4 aerators at the same time.											
Axial flow pumps: Capacity : 300m3/h	P7a,b,c	7,5	380	3	ea	DOL	2	1	On/off	Local isolator	N/A
CLARIFIER											
Clarifier drive	CD1	0,75	380	1	ea	DOL	1		On/off	Local isolator	N/A

PUMPS IN PUMP STATION												
Biofilter Recycle pumps (P2a,b)	P2a,b	15	380	2	ea		VSD	1	1	On/off/Test. On = stop low level, start HL. Elephant ball type float switches	Local isolator	ELECTRO MAG FLOW METER
Anoxic Retun pumps (P3a,b)	P3a,b	7,5	380	2	ea		DOL	1	1	On/off/Test. On = stop low level, start HL. Elephant ball type float switches	Local isolator	ELECTRO MAG FLOW METER
WAS Pumps (P4a,b)	P4a,b	2,2	380	2	ea		DOL	1	1	On/off/Test. On = stop low level, start HL. Elephant ball type float switches	Local isolator	ELECTRO MAG FLOW METER
RAS Pumps (P5a,b)	P5a,b	11	380	2	ea		VSD	1	1	On/off/Test. On = stop low level, start HL. Elephant ball type float switches	Local isolator	ELECTRO MAG FLOW METER
Clarifier clear water lift pumps (P6a,b)	P6a,b	11	380	2	ea		VSD	1	1	On/off/Test. On = stop low level, start HL. Elephant ball type float switches	Local isolator	ELECTRO MAG FLOW METER
MCC4 -CHLORINE ROOM EQUIPMENT												
Chlorine booster pumps	P8a,b	2,2	380	1	ea		DOL					N/A
Chlorine injectors	N/A	N/A	N/A	N/A	N/A		N/A					N/A
Chlorinators	CLOa,b	0,5	380	1	ea		DOL					N/A

MCC1 EXISTING



MCC2 EXISTING

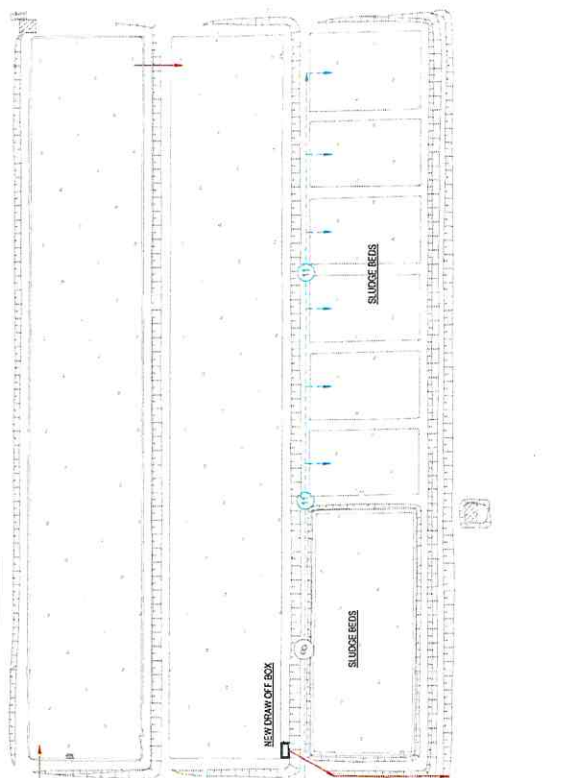
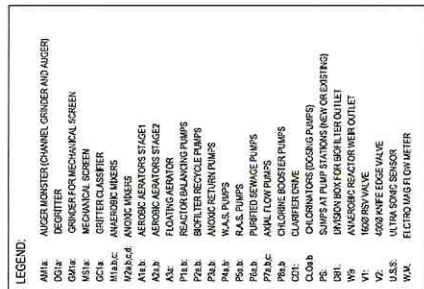
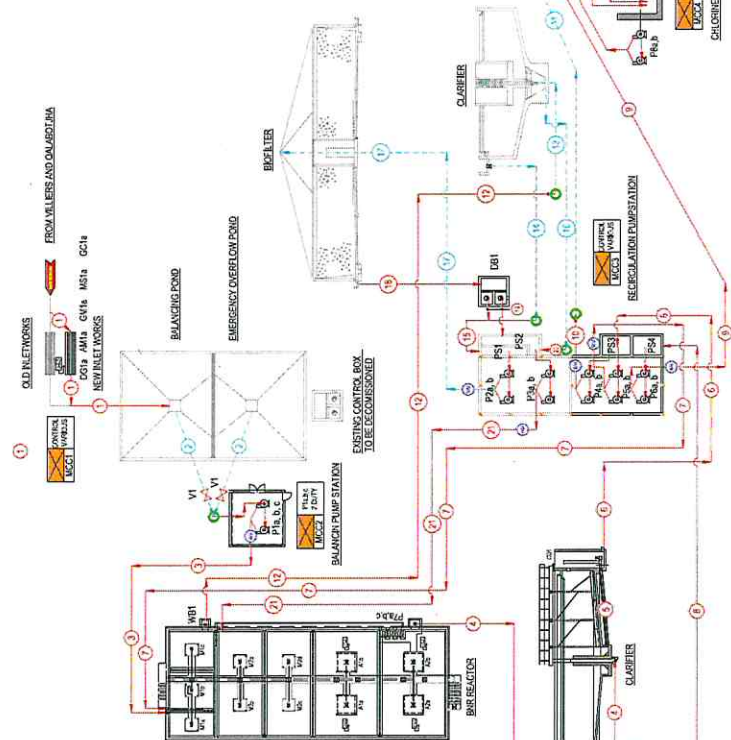
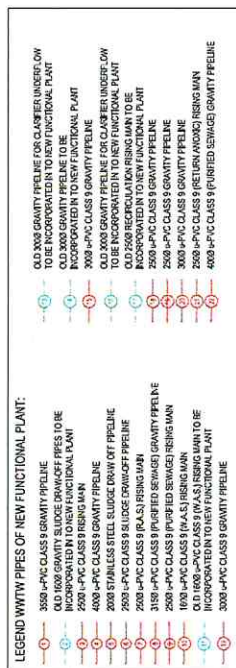




MCC3 EXISTING



IMCC4 EXISTING

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ANNEXURE D



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Design according to SANS 10225:2012
Ultimate Limit State Design

DESIGN REPORT

Client:

Standard

Ref No.: 17-12-04-14:11:01

Cutting List Used:

25m Sc Mast: Sect 2-10: And Add Pipe Dia |152x3x2000,

Mast Description:

25m, SCISSOR MAST, NOTE: Beka Omnistar

2	0m	40.0m/s	0.0m	0.85	355MPa
Terrain Category	Altitude	Regional Wind speed	Artificial Base Height	Importance Factor	Steel Yield Stress

Mast Loading

Description of Concentrated Loadings	Wind Area (m ²)	Cf	Distance from top (m)	Mass (kg)
Scissor Ring	0.26	0	0	40
8 x 470W, Circular, Sc mast Ring	1.33	1.5	0	212.8

Applied Bending Moment

No Applied Bending Moment

Mast Geometry and Properties

The mast cross-section is: Octagonal

Top Diameter	0.152m	Top Section	2	Mast Actual Height	24.9m
Bottom Diameter	0.567m	Bottom Section	10		
		Gust Loading Factor	3.089		

Bending Moments & Forces

Max Actual-/Allow Bending Moment @12.5m
Bending Moment @ Base
Total Horizontal Force

Actual(SLS)	Actual(ULS)	Allowable	(Actual/Allow)
34.6kNm	70.7kNm	74.3kNm	95.18%
106.8kNm	218.5kNm	233.2kNm	93.69%
7.6kN	15.5kN		

Deflections

Maximum Angle (Degrees)
Maximum Displacement

Serviceability-	Ultimate Limit State
3.5	7.2
0.64m	1.32m

Masses

INFORMATION ONLY

INFORMATION ONLY

Foundation Bolts

(Min Tensile Strength: 550MPa)

Tension Force on Foundation Bolts: (230mm Apart)

8 x M30 Equi Spaced ON PCD680mm

Actual	Allowable	(Actual/Allow)
162.5kN	206.6kN	78.7%

Base Flange:

569	680	794	30
ID	PCD	OD	t

Benjy Schraader

2017-12-04

Originator

Date

Signature of Pr. Eng

Pr. Number

Date



SECTIONAL POLES

Drawing Number

FD-17-12-04-14-11-01.pdf

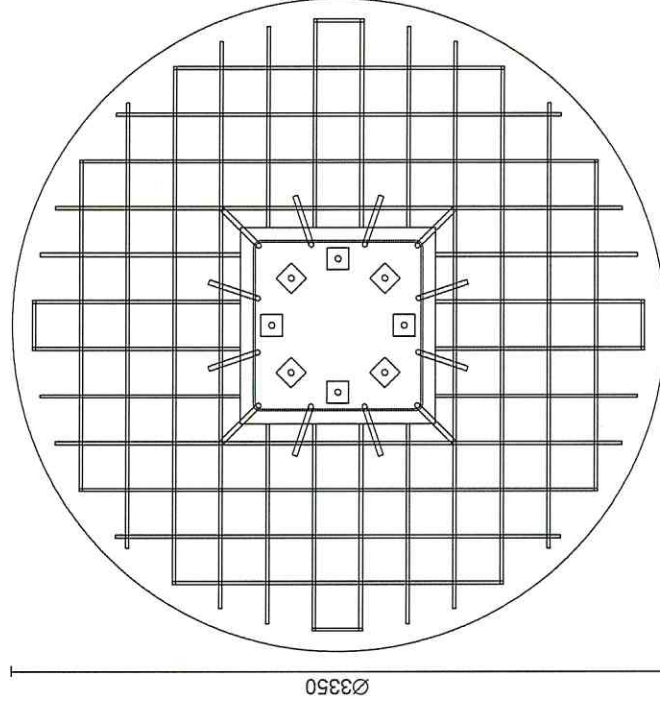
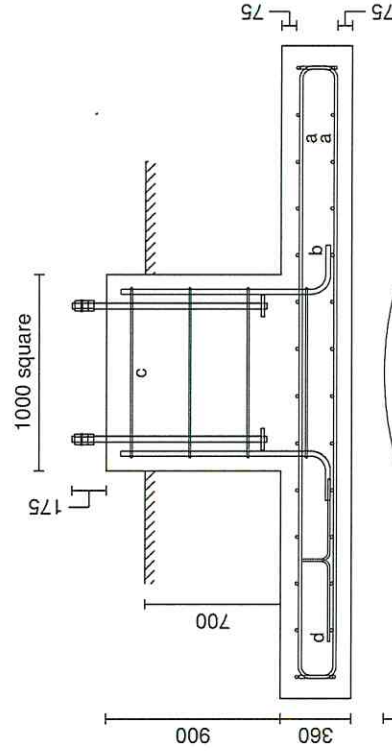
Mast/Structure Description: 25m Sc Mast, 8x470W, Cat2, Hasl.0m

Bending Moment (ULS):	218.5 kNm	Concrete Volume:	4.1 m ³
Shear Force (ULS):	15.5 kN	Concrete Strength:	25 MPa
Structure Mass:	1691.1 kg	Reinforcement Mass:	315.3 kg
Applied vertical force (ULS):	0.0 kN	Reinforcement Strength:	450 MPa
Required Soil Pressure:	143.0 kPa	Excavation Volume:	9.3 m ³
		Backfill Volume:	5.5 m ³

INFORMATION ONLY

Shape codes and dimensions of steel reinforcement according to SABS 82:

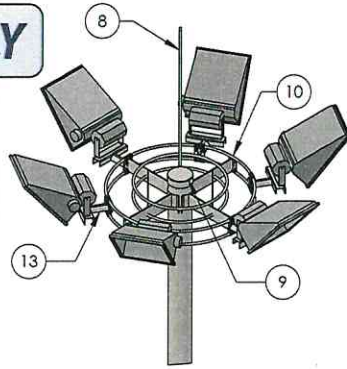
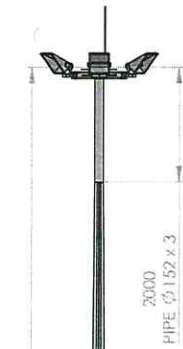
Ref.	Quantity		Diameter		Full Length		Diagram	Shape Code
	Top	Bottom	Top	Bottom	Top	Bottom		
a1	4	4	16	16	3441	3141		38
a2	4	4	16	16	3366	3066		
a3	4	4	16	16	3210	2910		
a4	4	4	16	16	2960	2660		
a5	4	4	16	16	2584	2284		
a6	4	4	16	16	1999	1699		
a7	4	4	16	16	556	256		
b	12		25		1268			37
c	4		10		3500			60
d	15		12		1446			83



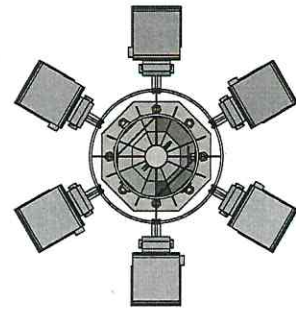
Notes:

1. Foundation Bolts per Plynth: 8x M30Plate, 680 mm PCD , UTS 550 MPa min, fixing templates to be placed at top and bottom of bolts before casting
2. Positioning of stools (Ref. d) to be determined on site to provide sufficient support between Top and Bottom bars (Ref. a)
3. Bottom and top reinforcement mats each consist of 14 x 14 bars at 240 mm spacing

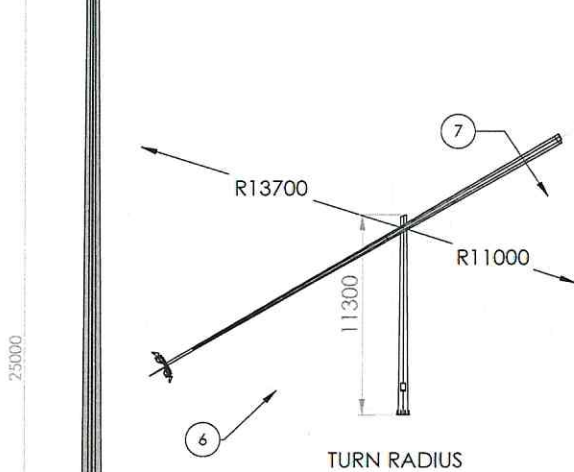
INFORMATION ONLY



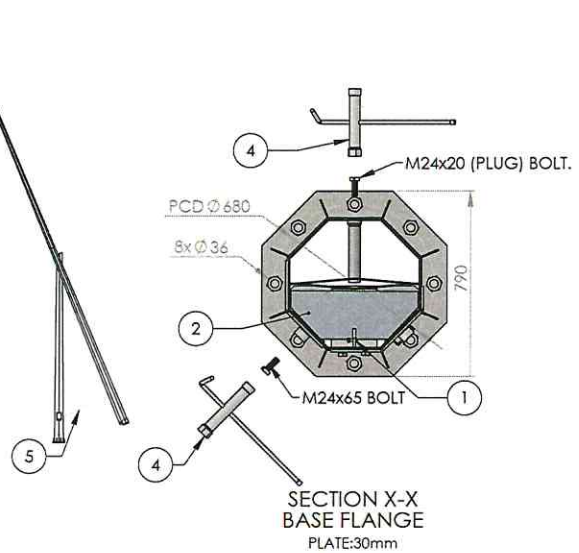
ISOMETRIC TOP VIEW



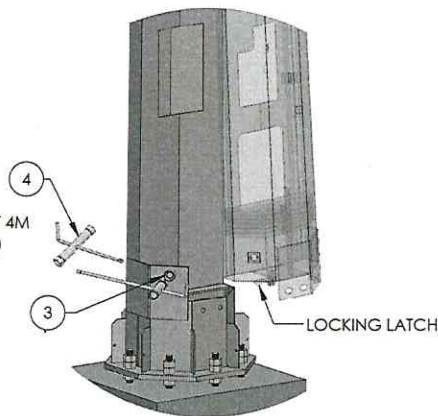
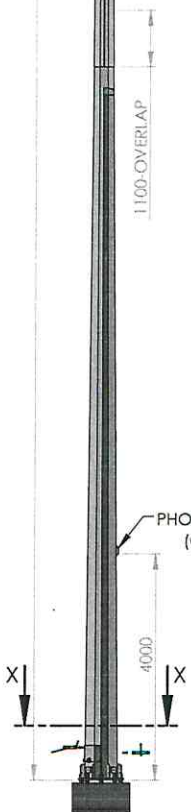
TOP VIEW



TURN RADIUS



SECTION X-X
BASE FLANGE
PLATE: 30mm



ISOMETRIC BASE VIEW

ITEM	DESCRIPTION	STOCK NUMBER	QTY
14	SM Warning Light Bracket	F00135	optional
13	SM LAMP BRACKET 100	F00321	6
12	SM LAMP BRACKET 300	F00322	
11	SM LAMP BRACKET 430	F00323	
10	SM TOP DIA 150	F00320	1
9	POLE CAP FOR 150 DIA -ON MAST	F00237	1
8	GENERAL LIGHTNING SPIKE	F00402	1
7	POLYESTER LOWERING ROPE SM25 -33m	F00315	1
6	RETAINING ROPE SM25 - 8.5m	F00185	1
5	SLING FOR SAFETY DEVICE -1m	F00340	1
4	SPANNER FOR SM	F00204	1
3	LOCKING CUP	F00109	2
2	COUNTERWEIGHTS		TBD.
1	COUNTERW.RET.TRIANGLE 120x90x6	F00181	

00 16-11-30-15:02:03 CSVRM
 OPT REF.NO. DRAWN DATE APP'VD DATE

Sectional Poles
 SINCE 1966

TITLE: 25M SCISSOR MAST ASSEMBLY DRAWING

DWG NO. SM25-M2-R0-6FL-LED-360

CLIENT:

DO NOT SCALE DRAWING
 UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN MILLIMETRES
 DIMENSIONAL 0-200mm ±2mm
 200 < ± 1%
 ANGULAR ±2°
 DIAMETER ±0.1mm
 MATERIAL THICK. 0.4 - 1mm
 OVAL ±2.5%

SIZE: A4 SCALE:
 MATERIAL: M/S
 SHEET 1 OF 1

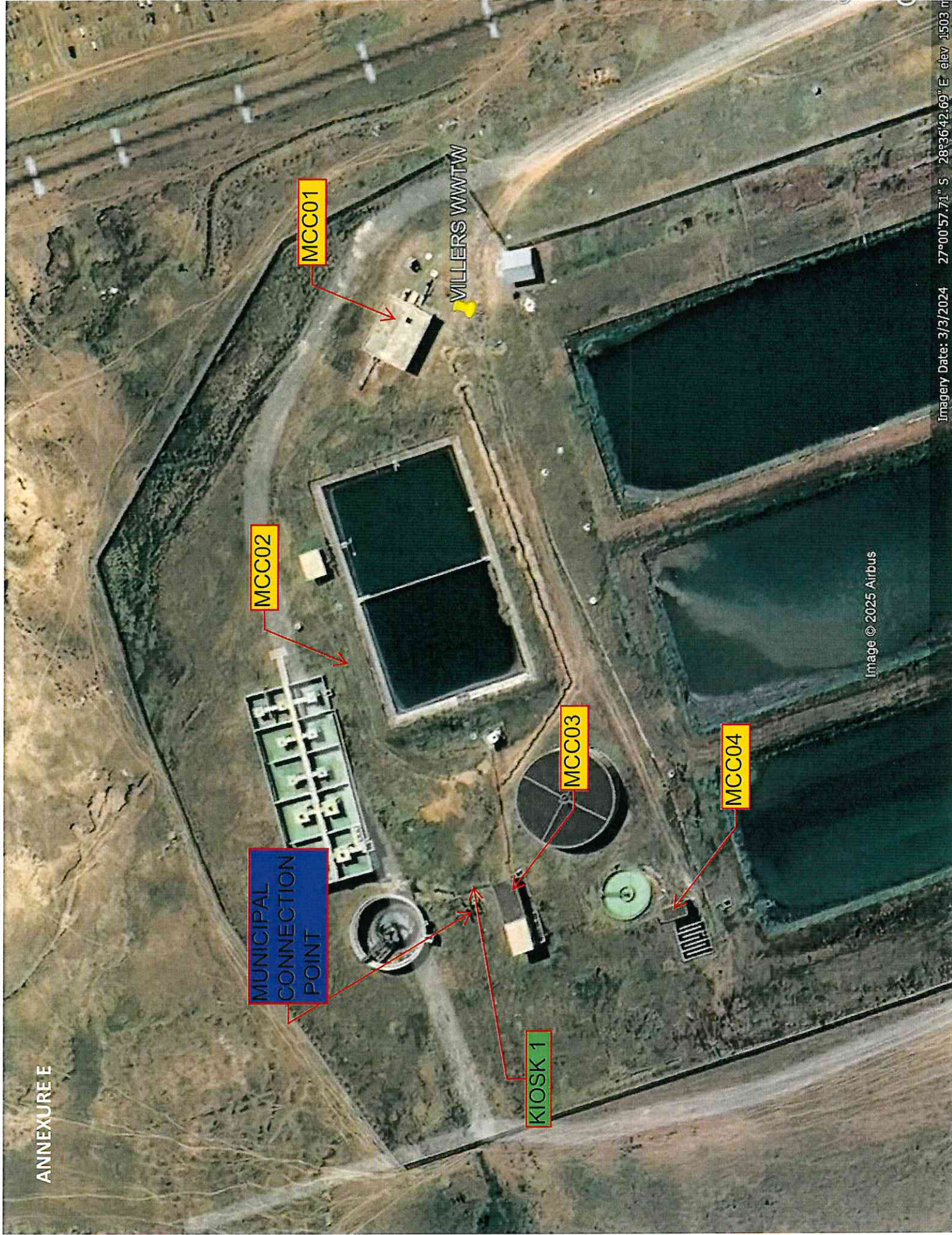


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